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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/904,906	07/16/2001	Takeshi Fukada	740756-2332	4431

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EXAMINER

MALSAWMA, LALRINFAMKIM HMAR

ART UNIT	PAPER NUMBER
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2825

DATE MAILED: 01/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/904,906

Applicant(s)

FUKADA ET AL.

Examiner

Lex Malsawma

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2001 and 02 December 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 08/311,275.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 to 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-8 and 13-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aldinger et al. (4,591,537, hereinafter, "**Aldinger**") in view of Yamazaki et al. (5,946,561, hereinafter, "**Yamazaki**").

Regarding Claims 1-8 and 13-20:

Aldinger discloses a substrate 1 assembly comprising aluminum nitride and oxygen; AlNO; AlN containing oxygen; and/or aluminum nitride and oxygen, wherein the oxygen concentration is about 0.1 to 5 % (note col. 1, lines 44-56). Aldinger **lacks** disclosing that the substrate is specifically for a display and that the substrate is a combination of a glass substrate and a film comprising the aluminum nitride and oxygen. Yamazaki is cited primarily to show it was very well known in the art to incorporate a film comprising aluminum nitride into a display device. Yamazaki **teaches** (in Figs. 12A-12E and col. 21, lines 50-55) a display device comprising a substrate 1101 of glass with an aluminum nitride film 1102 provided over the substrate, wherein the film 1102 has a thickness of about 1000 to 2000 Å. It would have been an obvious matter of design choice for one of ordinary skill in the art to modify Aldinger by specifically utilizing the substrate 1 for a display device (similar to that shown by Yamazaki) especially because Aldinger discloses the substrate generally provides very good heat

conductivity for electronic devices (note col. 1, lines 20-36), wherein the heat dissipating ability of Aldinger's substrate would be ideal for an LCD device as shown by Yamazaki.

3. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aldinger (in *view of* Yamazaki) as applied to Claims 1-4 above, and further in view of Knudsen (5,283,214).

Regarding Claim 9-12:

Aldinger (in view of Yamazaki) discloses that the substrate comprising aluminum nitride and oxygen provides, on the average, a thermal conductivity between 140 and 180 W/mK (see col. 3, lines 11-20). Note that Aldinger specifies that the thermal conductivity depends upon the kind and concentration of additives, and that the thermal conductivity could be further augmented if desired. (note col. 3, lines 18-20). Aldinger (in view of Yamazaki) **lacks** specifically disclosing a thermal conductivity of 200 W/mK or more. Knudsen **teaches** a process for increasing the thermal conductivity of aluminum nitride, wherein the process produces a film comprising aluminum nitride and oxygen (note col. 3, lines 15-21). Knudsen discloses it was very well known in the art that aluminum nitride films having a thermal conductivity of 200 W/mK or more have been utilized (note col. 2, lines 22-35, 46-51); therefore, it would have been an obvious matter of design choice for one of ordinary skill in the art to modify Aldinger (in view of Yamazaki) by specifically utilizing a film having a thermal conductivity of 200 W/mK or more because Knudsen teaches it was well known in the art to form, or utilize, aluminum nitride film having thermal conductivities above 200 W/mK.

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Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The references listed on the attached "Notice of References Cited" (not specifically cited above) have been cited to show aluminum-nitride films comprising oxygen similar to the aluminum-nitride film of the current invention.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lex Malsawma whose telephone number is 703-306-5986.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 703-308-1323. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Lex Malsawma



January 12, 2003



MATTHEW SMITH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800